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Prevalence of odontogenic sinus tracts in 728 endodontically treated teeth

Shiva Sadeghi, Mosa Dibaei

Assistant professor, Department of Endodontics, Dental School/Dental Research center, Guilan University of Medical Sciences, Opp. Pardis Hotel, Rasht, Iran

Correspondence:

Department of Endodontics,
 Dental School/Dental Research center,
 Guilan University of Medical Sciences,
 Opp. Pardis Hotel, Rasht, Iran
sadeghi.dds@gmail.com

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Abstract

Objectives: The primary aim of this study was to assess the prevalence of sinus tracts in endodontically treated teeth in an Iranian population. The second aim was to seek and analyze the relationship between the clinically detected sinus tracts and factors such as sex, age, tooth type and location.

Study design: A total of 728 patients' records and radiographs were reviewed of 427 females and 301 males for demographic data, preoperative pulpoperiapical status of treated teeth and the presence of sinus tract. Data were analyzed using chi-square test.

Results: No significant differences were found for the prevalence of sinus tracts between two genders. Data showed that the highest prevalence of sinus tracts was in 10-19 year age group. Of 725 treated teeth, 107 teeth had sinus tracts (14.7%). Most odontogenic sinus tracts were associated with mandibular anterior teeth. Of 348 teeth with preoperative status of periapical inflammation and radiolucency, 107 teeth (30.75%) had an odontogenic sinus tract.

Conclusion: Data showed that almost one in seven teeth referred for root canal treatment had a sinus tract.

Key words: *Odontogenic, sinus tract, prevalence.*

Introduction

Odontogenic sinus tract is one of the manifestations of chronic dental infections which provides a path for drainage of pus and infection. The opening of an odontogenic sinus tract can be located either intraorally or extraorally. It depends on the location of the perforation in the cortical plate by the inflammatory process and its relationship to facial- muscle attachments (1, 2).

An intraoral opening (parolis) usually indicates presence of a necrotic pulp or chronic apical abscess and sometimes a periodontal abscess. Gutta- percha placed

in the sinus tract occasionally assists in tactile and radiographic localization of the source of these lesions.

An extraoral opening or cutaneous sinus tract may be confused with a wide variety of diseases including local skin infection, ingrow hair or occluded sweat gland duct, osteomyelitis, neoplasms, tuberculosis, actinomycosis, and congenital midline sinus of the upper lip (3-9).

Many patients with odontogenic sinus tract undergo multiple inappropriate therapies before the correct diagnosis of the source of the lesion. Thus, it is important

for clinicians to evaluate the prevalence of odontogenic sinus tract in the society in order to accelerate diagnose and treatment. Furthermore, data concerning the epidemiology of odontogenic sinus tracts are essential to plan for the future treatment needs and programs and provide the opportunity to compare different population regarding this condition. A literature review revealed that only a few studies have dealt with prevalence of odontogenic sinus tracts. Gupta and Hasselgren showed that among the 160 permanent teeth with preoperative status of periradicular inflammation, 29 teeth (18.1%) had an odontogenic sinus tract (2). Mortensen et al. reported that among 1600 teeth with periapical lesions, 136 (9.0%) teeth had sinus tracts (10). However, the relationship between clinically detected lesions and factors such as sex, age, tooth type and location has not been investigated. Therefore, the primary aim of this study was to report the prevalence of sinus tracts in endodontically treated teeth in an Iranian population. The second aim was to seek and analyze the relationship between the clinically detected sinus tracts and factors such as sex, age, tooth type and location.

Materials and Methods

In this retrospective cross-sectional study, which was approved by the ethical and scientific committee of Guilan University Dentistry Faculty, the records and radiographs of all patients referred for root canal treatment during 2007 and 2008 were reviewed. Data regarding age, sex, number and preoperative status of treated teeth including vital, nonvital, previously endodontically treated teeth with/without periapical radiolucency and the presence of sinus tract were gathered from patients' records. All sinus tracts had been traced with gutta-percha and radiographs had been taken. Statistical analysis of the data was performed using SPSS 13.0 and Chi square analysis at a significant level of $p < 0.05$.

Results

A total of 728 patient records were reviewed of 427 females and 301 males who received endodontic treatment during the study period. No significant differences were found in the occurrence of sinus tracts between two genders (Fig. 1).

Patients' age varied from 10 to 69 years. There was no

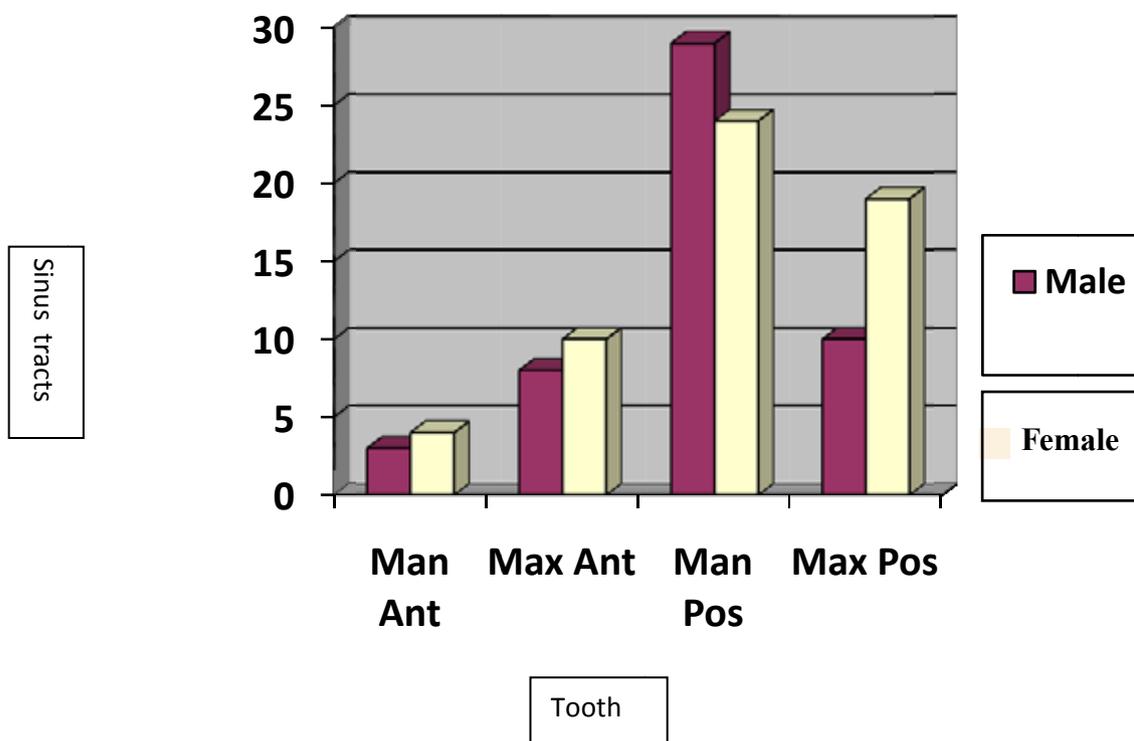


Fig. 1. N° of sinus tracts in different teeth according to gender

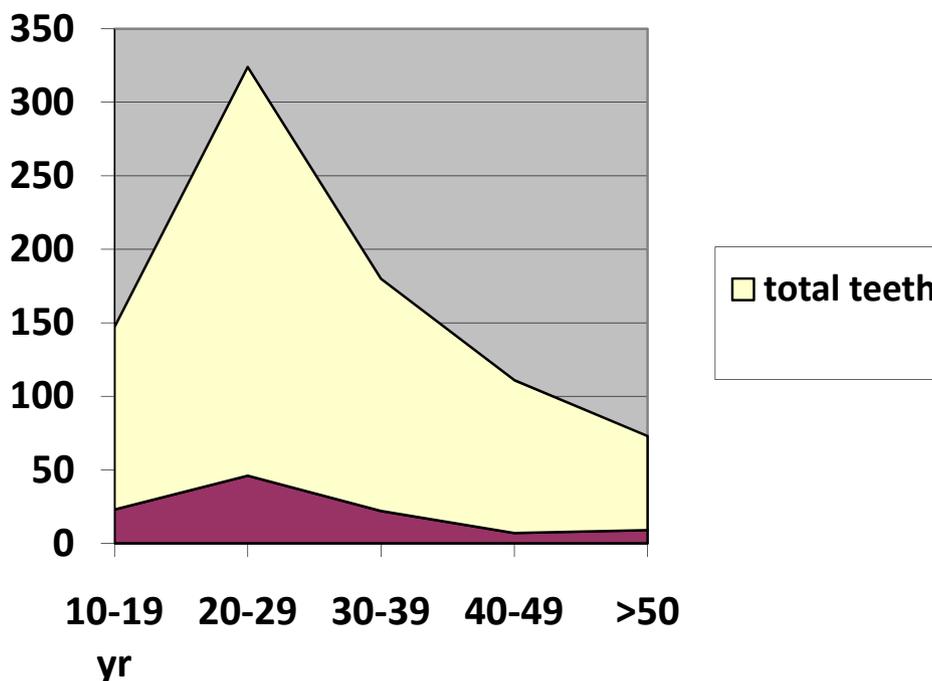


Fig. 2. N° of sinus tracts in different age groups

significant relationship between the prevalence of sinus tracts and age. However, the highest prevalence of sinus tracts was in 10-19 year age group (Fig. 2).

Table 1. N° of teeth and sinus tracts.

	N° of teeth	N° of sinus tracts	% of sinus tracts
Maxilla			
Anterior	87	18	20.69%
Posterior	315	29	9.21%
Mandible			
Anterior	16	7	43.75%
Posterior	310	53	17.1%
Total	728	107	14.7%

Sinus tracts were found in 107 of 725 teeth which have received root canal therapy (Table 1). The prevalence of sinus tracts in mandible was significantly higher than maxilla (p=0.011). The prevalence of sinus tracts in anterior teeth was significantly higher than posterior teeth (p=0.001).

Of 725 treated teeth 533 teeth were vital, 194 teeth were nonvital and 21 teeth were previously endodontically treated. No sinus tract was found in treated teeth without periapical radiolucencies. Of 348 teeth with preoperative status of periapical inflammation and radiolucency, 107 teeth (30.75%) had an odontogenic sinus tract (Table 2).

Table 2. Percentage of sinus tracts according to preoperative status.

Preoperative status	N° of teeth	N° of sinus tracts	% of sinus tracts
Vital teeth with radiolucency	192	9	4.69%
Nonvital teeth with radiolucency	144	91	63.20%
Previously endodontically treated teeth with radiolucency	12	7	58.34%
Total	348	107	30.75%

Discussion

In this study all odontogenic sinus tracts had intraoral opening. All sinus tracts had been traced with gutta-percha and radiographs had been taken. The clinician must take into consideration that the location of the sinus tract opening does not necessarily indicate the origin of the inflammatory exudates (3). Dental etiology can be confirmed by tracing the sinus tract to its origin with gutta-percha or similar radiopaque material, by radiographic examination and by pulp vitality testing.

According to the results of present study, most odontogenic sinus tracts were associated with mandibular anterior teeth. There was no significant relationship between the prevalence of sinus tracts and factors such as age and sex. These findings can not be compared with the existing data because so far no published reports are available.

Of 725 treated teeth, 107 teeth had sinus tracts (14.7%). No sinus tract was found in treated teeth without periapical radiolucencies. Of 348 teeth with preoperative status of periapical inflammation and radiolucency, 107 teeth (30.75%) had an odontogenic sinus tract. In other words, in this study the prevalence of sinus tracts and teeth with periapical radiolucency were much higher than results reported by Gupta and Hasselgren (2) and Mortensen et al (10). Despite the anatomical variations, referral time seems to be important as the possible explanation for the differences. Probably, in our population patients delay their tooth treatment due to lack of knowledge or suitable dental services. Duration of irritation and egress of irritants from untreated teeth into the periapical tissue causes periapical inflammation and bone resorption. This process may be progressive and finally perforates the cortical bone and forms a sinus tract. Furthermore, it has been reported that the longer the sinus tract persists, the more likely it is to have an epithelial lining (3, 11, 12) which may affect the prognosis of endodontic treatment.

Therefore, the patients need to be advised of suitable and prompt treatment of the diseased teeth in order to prevent periapical inflammation and forming sinus tracts.

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